

1.0 INTRODUCTION

This Urban Water Management Plan (UWMP) was prepared in accordance with the California Urban Water Management Planning Act of 1984. Appendix A presents a copy of the Act and its provisions. The Act has been amended several times since its passage, with the most recent amendment in 2000. The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an Urban Water Management Plan. Pursuant to section 10621.a. of the Act, each urban water supplier shall update its plan at least once every five years on or before December 31, in calendar years ending in five and zero.

1.1 Formation of Waterworks District 40

The Los Angeles County Waterworks District No. 40 (LACWWD) was formed in accordance with Division 16 Sections 55000-55991 of the State Water Code to supply water for urban use throughout the Antelope Valley. A vicinity map of the service area is included in Figure 1-1. The District is governed by the Los Angeles County Board of Supervisors with the Waterworks and Sewer Maintenance Division of the County Department of Public Works providing administration, operation, and maintenance of the District's facilities.

The District is comprised of eight regions serving customers in the communities of Lancaster and Palmdale (Region Nos. 4 and 34), Pearblossom (Region No. 24), Littlerock (Region No. 27), Sun Village (Region No. 38), North East Los Angeles County (Region No. 35), Lake Los Angeles (Region No. 38), and Rock Creek (Region No. 39). Regions 4 and 34 are integrated and are operated as one system. Similarly, Regions 24, 27, and 33 are also integrated and are operated as one system. Figure 1-2 shows a map of the region boundaries.

1.2 Public Participation

A public hearing was held to include public review and comments on the 2000 UWMP. The UWMP was adopted by the Board of Supervisors and submitted to the California Department of Water Resources within 30 days of the Boards adoption.

1.3 Coordination within the County

The Los Angeles County Department of Public Works (LACDPW) Waterworks and Sewer Maintenance Division staff has coordinated with the County Planning Department to develop this plan.

1.4 Interagency Coordination

LACDPW Waterworks District 40 is a retail agency under the service area of Antelope Valley East-Kern Water Agency (AVEK). There was coordination with AVEK's staff in estimating projected imported water supplies that will be available to District 40.

1.5 Climate

The Antelope Valley is approximately 2,400 square miles and lies in the southwestern Mojave Desert, encompassing portions of northern Los Angeles County, southern Kern County, and western San Bernardino County. The valley is bounded on the southwest by the San Gabriel Mountains, on the northwest by the Techachapi Mountains, and on the east by a series of hills and buttes that generally follow the San Bernardino County line.

Ground surface elevations within the Antelope Valley range between 2,300 feet and 3,500 feet above mean sea level (MSL). Temperatures often exceed 100°F during the summer months, with a mean temperature range between 63°F and 93°F. During winter months, the mean temperature ranges between 34°F and 57°F.

Average precipitation within the Antelope Valley watershed ranges between five and ten inches per year, from less than five inches per year along the northerly boundary of the Valley to about ten inches per year along the southerly boundary. Most precipitation occurs between October and March. Short duration thunderstorms do sometimes occur during the summer months.

1.6 Other Demographic Factors

District No. 40 and its sphere of influence (SOI) encompasses approximately 554 square miles of the valley floor and adjacent foothills of the Antelope Valley (190 square miles within District 40, 364 square miles within SOI). Of the 554 square miles, approximately five square miles are public lands (and therefore undevelopable) under the jurisdiction of the United States Bureau of Land management (USBLM). As such, there are approximately 549 square miles of land within District No. 40 and its SOI that are available for development.

Prior to the 1940s, human activity within the Antelope Valley was largely confined to Native Americans, miners, and pioneering agricultural families. Significant growth began with rapidly increasing military and agricultural activity during and immediately after World War II. The military presence resulted from the opening of Muroc Army Air Base, which was subsequently, renamed Edwards Air Force Base (AFB) in memory of Captain Glen Edwards, who was killed while test flying an experimental bomber in 1948. By about 1953, agricultural uses occupied approximately 73,000 acres producing primarily feed crops such as alfalfa, barely, and wheat.

Land uses in the valley have been transitioning from agricultural uses to residential and commercial uses for some time. By 1993, only about 12,800 acres remained in agricultural production. Some industrial growth occurred, much of that is associated with the aerospace industry. The valley is also mined for various minerals, including borate, aggregate, and salt. Nevertheless, employment within the valley is limited, with a large percentage of the population commuting to jobs in the southerly portions of Los Angeles County.

The project planning area constitutes the portion of the Antelope Valley wherein LACWWD either already provides or is prepared to provide water service. Existing development primarily occupies Regions 4 and 34. It also occupies portions of the remaining regions, which are situated southerly, southeasterly, and easterly of Regions 4 and 34. Future development is expected to occur within Regions 4 and 34 primarily as infill and as new development westerly of the cities of Lancaster and Palmdale, and in undeveloped areas within the remaining regions.

1.7 Population

The population within the Districts service area has increased steadily over the past several years from about 108,000 persons in 1990 to about 128,000 persons in 2000. Population is expected to increase significantly over the next 20 years. Population estimates have been made by the Los Angeles County Department of Regional Planning (LACDRP) (LACDRP, 1994). Population projections are summarized in Table 1-1.

Table 1-1					
Population Projections					
	2000	2005	2010	2015	2020
Service Area Population	128,000	210,900	293,800	328,050	362,300

1.8 Past Drought, Water Demand, and Conservation Information

The most recent drought was experienced between 1987 and 1992. Because the drought was preceded by the wettest period in California history, State reservoirs were full and the impact of the drought was not really felt until 1990. The District's approach was to implement a phased conservation plan to reduce the district water demands and make up the difference by pumping more groundwater. The District is currently planning to conduct a joint Artificial Storage and Recovery (ASR) project with Antelope Valley East-Kern Water Agency (AVEK). If this proves to be feasible, the District will then be able to store sufficient treated imported water from AVEK in the groundwater basin during wet years or winter months, and withdraw it during times of drought.

Water conservation programs in the Antelope Valley are primarily directed at urban areas, and are provided through agencies like LACWWD, the City of Lancaster, and the City of Palmdale. Demand management is one of the most effective means of water conservation. Many specific demand management measures are already enforced by

existing federal and state law. For instance, water efficient showerheads and toilets are required by building codes. Additional measures are either mandated or allowed, such as the use of household gray water for residential irrigation purposes.

On April 11, 1996, District 40 became a signatory to the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU). Becoming a signatory increases the District's commitment toward implementing water conservation projects to prepare the service area for potential water shortages.

2.0 WATER SUPPLY

Water supplies for the District are obtained from both local and imported sources. Local groundwater currently satisfies approximately 40 percent of the District's demand. Imported water is purchased from AVEK and provides the remaining 60 percent of the District's water demand. Except for emergency interconnections with some retail agencies, there are no water exchange or transfer programs on a short-term or long-term basis. Targeted contributions from groundwater production and imported water purchases have been established by LACWWD at a ratio of 80 percent imported water (including any waters produced from the ASR program) and 20 percent groundwater.

Table 2-1 sets forth current and projected water supply estimates. Current supply requirements reflect actual recorded quantities of groundwater production and imported water (AVEK) purchases. Projected supply estimates for imported water and groundwater are based on the Draft 1999 Master Plan.

Table 2-1					
Current and Projected Water Supplies					
Water Supply Sources	2000⁽¹⁾	2005	2010	2015	2020
Purchased from wholesaler					
AVEK	30,600	57,764	77,404	83,860	90,726
Supplier produced groundwater	18,600	14,441	19,351	20,965	22,681
Supplier produced surface diversions					
Transfers/Exchanges					
Recycled Water					
Other					
Total	49,143	72,205	96,755	104,826	113,407
Units of Measure: Acre-feet/Year					
(1) Estimated based on 1999 data					

2.1 Groundwater

The Antelope Valley Ground Water Basin (Basin) is comprised of two primary aquifers (commonly referred to as the deep aquifer and the principal aquifer), and is divided into twelve subunits. Due to past water extractions, primarily for agricultural purposes, pumping has exceeded the natural recharge. Water extractions (for the Los Angeles County portion of the Valley) increased from 29,000 AF in 1919 to approximately 400,000 AF in 1950. This was followed by a decline to 53,000 AF in 1983. However, due to increasing urban development, extractions have increased to a high of 92,000 AF in 1992. According to the USGS, the safe yield of the Basin is estimated to be somewhere between 31,200 AF/Yr and 59,100 AF/Yr.

The groundwater extractions between 1926 and 1972 resulted in the overdraft of the aquifer that caused the groundwater levels to drop 200 to 300 feet or an average of 4 to 6 feet per year.

With the completion of the state water project in the 1970's and the reduction of agricultural activity, groundwater extractions have been reduced. This has stabilized groundwater levels in some areas of the valley. Some District wells have actually shown a rise in groundwater levels.

The Antelope Valley Groundwater Basin is not adjudicated and existing pumpers and overlying landowners have correlative water rights in the basin and may pump without limit, so long as the water is being put to a beneficial use. To safeguard the basin and provide a reliable water supply for the present and future inhabitants of the area, there is a need to develop a program to manage the groundwater basin to bring extractions more in line with the perennial yield of the basin.

The District is currently planning to conduct an Artificial Storage and Recovery (ASR) full-scale project with Antelope Valley East-Kern Water Agency (AVEK). An EIR is currently being done for the ASR program. It is anticipated that the EIR process will be completed in October 2001 with the ASR program being implemented in November of that same year.

2.2 Imported Water

SWP deliveries to the valley began in 1972. AVEK, the Palmdale Water District (PWD), and the Little Rock Creek Irrigation District (LCID) provide SWP water to the Antelope Valley. SWP entitlements for the Valley State Water contractors currently total 158,000 AFY. Entitlements of AVEK, PWD, and LCID are 138,400, 17,300, and 2,300 AFY, respectively. However, a small portion of AVEK's SWP entitlement has historically been delivered to areas outside the Valley. Based on information provided by AVEK, it is estimated that approximately 3% of historic deliveries made by AVEK did not serve the Antelope Valley; as a result, it should be assumed that 3% of AVEK's future deliveries would be made to areas outside the Valley. The total amount of SWP entitlement water available to the valley is therefore about 153,800 AFY.

AVEK deliveries peaked in 1981 at approximately 79,400 AF, and overall SWP deliveries to the valley peaked the same year at approximately 80,600 AF. Since 1981, SWP deliveries to the valley have ranged between 14,000 and 58,700 AFY. Between 1976 and 1982, deliveries ranged between 19% and 92% of the total entitlements. Between 1983 and 1995, deliveries range between 9% and 69% of total entitlements.

California Department of Water Resources (CDWR) reports that existing SWP facilities have a 65% chance of making full deliveries for current demands and will have a 25% chance of making full deliveries for projected 2020 demands. The long term average of SWP deliveries to AVEK over the next 20 years is estimated to be 91,350 acre-feet per

year or 66 percent of AVEK's total entitlement. It is estimated that approximately 70 percent of AVEK's supplies will serve District 40 (personal communication, Russ Fuller, AVEK, 10/27/00).

Availability of SWP water varies from year to year, depending on the number of factors (precipitation, regulatory restrictions, legislative restrictions, and operational considerations), and is especially unreliable during dry years. Therefore, LACWWD groundwater supplies must be adequate to ensure that customer demands can be met.

In addition to SWP availability fluctuations, LACWWD's ability to use AVEK supplies is currently limited to certain portions of District 40 due to transmission facility restrictions. The maximum quantity of water that can currently be purchased from AVEK for direct delivery to LACWWD customers is about 60% of District Number 40's demand.

2.3 Reclaimed Water

There are several water reclamation plants (WRP) currently operating in the Antelope Valley; however, there are only two operating within Los Angeles County that treat significant waste streams and that generate large quantities of reclaimed water. The plants, which are both operated by the County Sanitation Districts of Los Angeles County (CSDLAC), serve the City of Palmdale and the City of Lancaster.

2.3.1 Palmdale WRP

The CSDLAC's District 20 operates the Palmdale WRP, which is located on 30th Street East, southeast of the Palmdale Airport. The Palmdale WRP is an undisinfected secondary treatment facility with a capacity of 8.0 million gallons per day (MGD). A portion of the effluent from Palmdale WRP is currently used for irrigating farmland on Los Angeles County Department of Airports (DOA) property. The DOA has a contract for up to 12 MGD of effluent. The remaining effluent is spread over 2,600 acres of land owned by the DOA. Approximately 0.3 percent of reclaimed water was used by local farmers on DOA property in 1991-1992. To accommodate anticipated growth in the Antelope Valley, CSDLAC intends to expand the plant to a capacity of 15.0 MGD.

2.3.2 Lancaster WRP

CSDLAC's District 14 operates the Lancaster WRP, which is located South East of the intersection of Antelope Valley Freeway (I-14) and Avenue C, near Edwards AFB. The Lancaster WRP is currently the only facility in Antelope Valley supplying tertiary treated water (0.6 MGD design capacity); however, the majority of the plant's flow is treated to a secondary treatment level. Total capacity of the plant is 10.0 MGD. Undisinfected secondary effluent from the WRP is used for irrigating farmland at Nebeker Ranch. Tertiary effluent is used at Apollo Lakes County Parks for lake and irrigation use. The

remaining effluent is disinfected and then discharged to Paiute Ponds. To accommodate anticipated growth in the Antelope Valley, CSDLAC intends to expand the plant to a capacity of 16.0 MGD.

3.0 WATER USE

3.1 Past, Current and Projected Water Use

Presently, there are approximately 128,000 residents within the District No. 40 service area. There are also about 28,000 residents outside its service area but within its SOI. About 80% of the water served within District No. 40 is distributed to single family and multi-family residential services.

Table 3-1 illustrates Past, Current, and Projected Water Use 1990 – 2020 in acre-feet per year. Table 3-2 illustrates Past, Current, and Projected Water Use 1990 – 2020 in number of connections per year.

Table 3-1 Past, Current and Projected Water Use (In Acre-Feet/Year)							
Water Use Sectors	1990	1995	2000	2005	2010	2015	2020
Single family residential	25,264	29,828	35,334	51,915	69,567	75,370	81,540
Multi-family residential	3,373	3,983	4,718	6,932	9,288	10,063	10,887
Commercial	2,670	3,153	3,735	5,488	7,353	7,967	8,619
Industrial	141	166	197	289	387	419	454
Institutional and governmental	Included In Other	Included In Other	Included In Other	Included In Other	Included In Other	Included In Other	Included In Other
Landscape	1,054	1,245	1,474	2,166	2,903	3,145	3,402
Conjunctive use	0	0	0	0	0	0	0
Agriculture	0	0	0	0	0	0	0
Other	2,635	3,111	3,686	5,415	7,257	7,862	8,506
Total	35,137	41,486	49,143	72,205	96,755	104,826	113,407

Table 3-2 Number of Connections by Customer Type							
Customer Type	1990	1995	2000	2005	2010	2015	2020
Single family residential	29,899	35,367	38,254	63,029	87,805	98,041	108,277
Multi-family residential	785	928	1,004	1,654	2,304	2,573	2,842
Commercial	1,014	1,200	1,298	2,139	2,979	3,327	3,674
Industrial	29	34	37	61	85	95	105
Institutional and governmental	140	165	179	295	411	459	507
Landscape/recreation	414	490	530	873	1,217	1,358	1,500
Agriculture	0	0	0	0	0	0	0
Other	339	401	434	715	996	1,112	1,228
Total	32,620	38,586	41,736	68,767	95,797	106,965	118,132

Past and current water use is based on supply requirements that reflect actual recorded quantities of groundwater production and imported water (AVEK) purchases. Projected water use includes unaccounted-for water at 5%. Projected supply requirements are obtained from the Districts 1999 Water System Master Plan and are based on projected population, planned land use, and water supply and consumption data. Future water requirements within the SOI of each of District No. 40's eight regions were included in the estimates assuming LACWWD will annex all areas within the current SOI.

3.2 Residential Sector

Single family residential customers are estimated to average about 3.17 persons per connection (Los Angeles County Department of Regional Planning, 1994), with an average consumption rate between 190 and 250 gallons/capita/day (gpcd). Multi-family residential customers are estimated to average about 2.3 persons per housing unit and seven units per multi-family complex, with an average consumption rate between 130 and 175 gpcd. Growth in the residential sector is projected to be considerable over the next 20 years as indicated on Table 3-1.

3.3 Commercial Sector

A variety of commercial customers exist within District No. 40 with uses that include family and high-volume restaurants, insurance offices, beauty shops, gas stations, hotels and motels, shopping centers, and other facilities that serve non-resident population. The commercial sector continues to expand each year, and growth is expected to continue to occur over the next 20 years in response to ongoing population increases. Average consumption rate for the commercial sector is estimated to be 2,000 gallons per acre per day.

3.4 Industrial Sector

District No. 40 serves a relatively small industrial sector, primarily centered on aerospace and light manufacturing. The industrial sector has grown somewhat in the last decade and is expected to continue to expand over the next 20 years. The average consumption rate for the industrial sector is estimated to be 3,000 gallons per acre per day.

3.5 Institutional/Governmental Sector

District No. 40 has a stable institutional/governmental sector, primarily local government, schools, visitor-serving public facilities, and medical facilities. This sector is expected to expand over the next 20 years in response to ongoing population increases. Consumption rates within this sector vary considerably depending upon the specific facility; however, for planning purposes, a consumption rate somewhere between commercial and industrial at 2,500 gallons per acre per day has been assumed (1999 Master Plan).

3.6 Landscape/Recreational Sector

Landscape and recreation customer demand is expected to increase gradually over the next 20 years due to continued growth in visitor-serving facilities. Increased efficiency and landscape conversions at existing parks, golf courses, and cemeteries should help offset new demand resulting from projected increases in this sector. The average consumption rate for landscape/recreation sector is estimated to be 1,500 gallons per acre per day.

4.0 WATER RELIABILITY

4.1 Reliability

The only firm water supply in the Antelope Valley is the groundwater supply. Imported water from the State Water Project may be reduced because of drought or it may be interrupted to make repairs or because of disaster. In 1991, for example, the State Department of Water Resources (DWR) reduced deliveries to only 20 percent of normal. Valley water agencies, including District 40, made up the difference by increasing their use of groundwater. It should be noted that District 40 also imposed a conservation program that required customers to reduce water usage by 20 percent. Customers who exceeded specified goals based on historical usage were required to pay surcharges.

From time to time, the State aqueduct system requires repairs. To minimize the impact of these repairs on the delivery of water to contractors, DWR generally schedules the repairs during winter months when water demands are lowest. The State Water Project delivery system is also subject to disaster, such as earthquake. To date, no major interruption of imported water deliveries has occurred because of a disaster.

The Antelope Valley is very fortunate to have a vast groundwater supply to utilize as a source of water supply. As described in Section 2.1, steps must be taken to manage the groundwater basin to protect this valuable and essential resource from water quality problems and the problems associated with overdrafting.

Reliability is a measure of a water system's expected success in managing water shortages. Reliability planning requires information about the following: (1) expected frequency and severity of shortages; (2) how additional water management are likely to affect the frequency and severity of shortages; and (3) how available contingency measures can reduce the impact of shortages when they occur.

4.2 Frequency and Magnitude of Supply Deficiencies

The District experienced a drought during the years of 1987-1991. Because the drought was preceded by the wettest period in California history, State reservoirs were full and the impact of the drought was not really felt until 1990. The County of Los Angeles adopted three ordinances in 1991 to reduce water use.

The first was Ordinance No. 91-0046U, which called for a water waste prohibition for the unincorporated areas of the county. The water saving measures included limiting car washes, excessive landscape watering, and prohibited washing of paved surfaces. Any failures to comply with these provision resulted in a fine.

The second and most significant measure adopted was Ordinance No. 91-0075M, which created the Phased Water Conservation Plan. This Plan would apply to all waterworks Districts within the County in order to meet available water supply. Through nine

phases, the Board of Supervisor would declare percentages of water use reductions in order to meet water supplies. In 1991, the Board of supervisors declared a “Phase Three” shortage with a goal to reduce water consumption in all District by 20 percent. Any customers that exceeded the target quantity a conservation surcharge would be assessed to their bill.

On June 27, 1991, the County adopted Ordinance No. 91-0097U, which amended the plumbing code by requiring the installation of ultra low flow toilet and urinals in all new buildings.

The District’s implementation of these ordinances resulted in a 20 percent reduction in water use. An increase in groundwater pumping was used to supplement supplies in order to meet demands.

4.3 Plans to Assure a Reliable Water Supply

The District is currently planning to conduct a joint Artificial Storage and Recovery (ASR) full-scale project with Antelope Valley East-Kern Water Agency (AVEK). If feasible, the District will then be able to store sufficient treated imported water from AVEK in the groundwater basin during wet years or winter months, and withdraw it during times of high demand and drought. The ASR program is not only vital to enable LACWWD to achieve the targeted 80/20 production ratio, but will also help to mitigate groundwater depressions in the area where it is utilized.

The Antelope Valley Groundwater Basin is estimated to have a storage capacity of 68 million acre-feet, of which at least 13 million acre-feet is currently thought to be available for storage. The ASR program would serve to mitigate deterioration of the groundwater body and would enable LACWWD to utilize some of the Basin’s available storage capacity.

4.4 Reliability Comparison

Table 4-1 details estimated water supply projections associated with several water supply reliability scenarios. The driest three-year sequence for the District’s water supplies in recent history was from 1990 to 1992. Supply per service connection for these years, along with the current number of service connections, are used in Table 4-1 for the multiple dry water years scenario. The supply per service connection data for the dry years are multiplied by the current number of service connections in order to account for growth within the District. Supply data for 1991 is used for the single dry water year scenario.

Table 4-1 Supply Reliability (In Acre-Feet/Year)				
		Multiple Dry Water Years		
Average / Normal Water Year 2000	Single Dry Water Year	Year 1	Year 2	Year 3
49,143	33,710	43,320	33,710	37,050

4.5 Water Transfers or Exchanges

Except for emergency interconnections with some retail agencies, there are no water exchange or transfer programs on a short-term or long-term basis.

5.0 SUPPLY AND DEMAND COMPARISON PROVISIONS

5.1 Supply and Demand Comparison

District 40 receives all of their water supply from AVEK and groundwater. Therefore, supply estimates are based upon the projected water deliveries from AVEK and assumed maximum groundwater extraction volumes.

Table 5-1 compares the projected supply and demand through the year 2020.

Table 5-1 Projected Supply and Demand Comparison (In Acre-Feet/Year)					
	2000	2005	2010	2015	2020
Supply totals	49,143	72,205	96,755	104,826	113,407
Demand totals	49,143	72,205	96,755	104,826	113,407
Difference	0	0	0	0	0

In the upcoming years, if there are consecutive dry years resulting in a water shortage, there is a water shortage contingency plan in place to reduce the amount of water use. The Los Angeles County Supervisors adopted such a plan in 1991 known as the “Phased Water Conservation Plan”. In it reductions are made in phases to reduce water uses in percentages. Section 7 of this report goes into further detail of this plan.

Table 5-2 presents a supply and demand comparison for the Districts current demand requirements with supply scenarios of one dry year and consecutive dry years. In Table 5-2, demand is not reduced in conjunction with a change in supply. Tables 5-3, 5-4, and 5-5 detail how supply and demand options can alter the outcome of a water shortage.

Table 5-2 Single Dry Year and Multiple Dry Water Years (In Acre-Feet/Year)					
Water Supply Sources	Current Supply 2000	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	49,143	33,710	43,320	33,710	37,050
Percent Shortage		31%	12%	31%	25%
Demand totals	49,143	49,143	49,143	49,143	49,143
Difference	0	(15,433)	(5,823)	(15,433)	(12,093)

Table 5-3 displays Supply and Demand comparisons in multiple dry water years with the Phased Water Conservation Plan in place. This comparison holds supply at the same level as Table 5-2.

Table 5-3 Supply Reliability and Demand Comparison with Phased Water Conservation Plan (In Acre-Feet/Year)					
Water Supply Sources	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	49,143	33,710	43,320	33,710	37,050
Demand totals	49,143	31,943	41,772	31,943	36,857
Difference	0	1,767	1,548	1,767	193

Table 5-4 modifies the comparison by increasing the supply available for use by increasing the amount of supply from groundwater in order to meet demands. Demand remains the same as in Table 5-2.

Table 5-4 Supply Reliability and Demand Comparison with Supply Options (In Acre-Feet/Year)					
Water Supply Sources	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	49,143	49,143	49,143	49,143	49,143
Demand totals	49,143	49,143	49,143	49,143	49,143
Difference	0	0	0	0	0

Table 5-5 modifies the comparison by increasing supply and modifying water user habits through conservation measures with the Phase Water Conservation Plan in place.

Table 5-5 Supply Reliability and Demand Comparison with Supply and Demand Options (In Acre-Feet/Year)					
Water Supply Sources	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Supply totals	49,143	34,400	44,229	34,400	36,857
Demand totals	49,143	34,400	44,229	34,400	36,857
Difference	0	0	0	0	0

6.0 WATER DEMAND MANAGEMENT MEASURES

On April 11, 1996, the County of Los Angeles Department of Public Works Waterworks District 40 became signatory to the Memorandum of Understanding (MOU) California Urban Water Conservation Council (CUWCC). Pursuant to Section 10631.h. of the Urban Water Management Plan Act (UWMPA), urban water suppliers that are members of the CUWCC may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10631.f. of the UWMPA.

Please refer to Appendix D for the FY 1999/2000 Best Management Practices Annual Report

7.0 WATER SHORTAGE CONTINGENCY PLAN

7.1 Water Shortage Response

As a result of the drought (1987-1991) and the serious supply situation the region undertook at the time, the County Board of Supervisors approved on March 23, 1991 the “Nine Phase Water Conservation Plan.” (A copy of the Plan is in Appendix C) This Plan imposed phased of voluntary and mandatory water reduction of water use for the waterworks districts, including District 40, up to 50 percent. The objective of the Plan is to minimize the effect of a water shortage on service area water users by encouraging customers to maximize beneficial use of water resources.

The “Phased Water Conservation Plan” is comprised of nine stages or “Phases” that call for the reduction of water use in order to meet a conservation target. The Plan was implemented at a time when the County determined that the water districts would suffer a severe water shortage unless water rationing was applied. The Plan accomplishes this by: (1) Setting in place a conservation target in phases to reduce water usage; (2) Financially discouraging wasteful or unreasonable water use and encouraging water conservation.

Table 7-1 Phased Water Conservation Plan RATIONING STAGES									
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9
Anticipated shortage in water supply	10%	15%	20%	25%	30%	35%	40%	45%	50%
Conservation Target as a Percent of Baseline Use	90%	85%	80%	75%	70%	65%	60%	55%	50%
Type of Rationing Program	Voluntary	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Source: Los Angeles County Ordinance No. 91-0075M

Table 7-1 displays the rationing stages the county adopted to reduce water usage. The conservation target is a percentage of the quantity used during a “base” billing period set by the Board of Supervisors. To discourage wasteful or unreasonable water use, a conservation surcharge is imposed for water use beyond those target goals. The conservation surcharge is \$3.00 per hcf (hundred cubic feet).

The baseline quantity amounts to the customer's actual water usage during the "base" billing period or the District average, whichever is higher. For water use in excess of the baseline quantity, the conservation surcharge is \$6.00 per hcf.

In 1991, the County Supervisors declared a "Phase 3" water shortage for the Waterworks Districts, which amounts to a 20 percent reduction of water usage. Therefore, a customer is charged the normal water rate for water usage up to 80 percent of the customer's baseline quantity. There is a \$3.00 per hcf surcharge for water usage between 80 percent and 100 percent of the baseline quantity. There is a \$6.00 per hcf surcharge for water used in excess of 100 percent of the baseline quantity. These surcharges are in addition to the normal quantity charges for water use.

In addition, the Plan will call upon the following water conservation measures as shown in Table 7-2, as water shortage increases.

Table 7-2 Phased Water Conservation Plan Water Conservation Measures in Phases				
Phase	Cutback %	Landscape Watering Restrictions	Construction Meter Restrictions	Other Restrictions
I	10	None	None	None
II	15	None	None	None
III	20	None	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
IV	25	Every Other Day	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
V	30	Every Other Day	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*
VI	35	Every Third Day	No New Construction Meters	Issuance Of "Will Serve" Letter Discontinued*

VII	40	Trees and Shrubs only by Bucket	Remove All Construction Meters	Issuance Of "Will Serve" Letter and Installation of all New Permanent Meters Discontinued*
VIII	45	Trees and Shrubs only by Bucket	Remove All Construction Meters	Issuance Of "Will Serve" Letter and Installation of all New Permanent Meters Discontinued*
IX	50	Trees and Shrubs only by Bucket	Remove All Construction Meters	Issuance Of "Will Serve" Letter and Installation of all New Permanent Meters Discontinued*

*"Will Serve" letters will be issued that will allow recordation of final maps; however, permanent metered service to the newly created lots will not be authorized until the current drought is over (mandatory rationing discontinued).

7.2 Catastrophic Water Supply Interruption

In the event of a catastrophe, the District has the following measures to prevent water shortages: (1) Groundwater supplies and emergency storage (2) Emergency connections to water retail agencies (3) Phased Water Conservation Plan (4) "No Waste" Ordinance.

7.3 Water Shortage Contingency Ordinances

The Board of Supervisors adopted Ordinances No. 91-0075M on May 23, 1991, which established the Phased Water Conservation Plan, and Water Wasting Prohibition Ordinance No. 91-0046U on March 21, 1991.

7.4 Three Year Minimum Water Supply

Table 7-3 Minimum Water Supply (In Acre-Feet/Year)				
Multiple Dry Water Years				
Average / Normal Water Year	Single Dry Water Year	Year 2001	Year 2002	Year 2003
49,143	33,710	43,320	33,710	37,050

7.5 Water Shortage Stages Triggering Mechanisms

The Phased Water Conservation Plan's Authorization to Implement Water Conservation requires the Board of Directors of the Waterworks Districts to determine the projected

water shortage in the County. This will be influenced by the District's imported water from AVEK. There could be internal influences in the District that could trigger the implementation of water conservation, such as a break in one of the mains, landslide, or earthquake that could impair the water facilities.

However, once the Board determined a water conservation phase should be implemented a public hearing is called for the purposes of determining whether a shortage exists in the Districts and which phased should be implemented. There are a number of nine stages that exist in the Plan to adopt with provisions to meet the targeted goal.

7.6 Mandatory Prohibitions on Water Wasting

On March 21, 1991, the Board of Supervisors adopted Ordinance No. 91-0046U "No Waste" that specified a number of water saving measures that applied only to unincorporated areas of the County. As shown in Appendix C, this Ordinance includes the following prohibitions:

- Washing down paved surfaces is prohibited unless required for health or safety
- Landscape watering is prohibited between 10:00 a.m. and 5:00 p.m.
- Excessive landscape watering that results in runoff into adjoining streets, parking lots or alleys is prohibited
- Plumbing leaks must be repaired as soon as practical
- Washing of vehicles is prohibited excepted at a commercial carwash or with a hand-held bucket or hose equipped with an automatic shutoff nozzle
- Serving drinking water at public eating places is prohibited unless requested by customers
- Water used in decorative fountains must flow through a recycling system

This Ordinance was active from March 1991 to January 1993. Currently, there is no water-wasting ordinance in effect in the County.

7.7 Excessive Use Penalties

Any customer violating the regulations and restrictions on water use set forth in the "No Waste" Ordinance or Phased Water Conservation Plan shall be penalized. According to the Phased Water Conservation Plan, a customer that uses water in excess of the target quantity will be assessed a conservation surcharge of \$3.00 up to \$6.00 per hcf on to their next water bill. In the event a customer violates the provisions in the "No Waste" Ordinance a fine of \$100.00 will be issued for the first infraction and a \$500.00 fine for each subsequent infractions. If water service is disconnected due to excess water use, it shall be restored upon payment of a hook-up charged determined by the County Rate Structure.

7.8 Revenue and Expenditures Impacts and Measures to Overcome Impacts

The implementation of the Phased Water Conservation Plan could result in significant short-term reduction in the District's revenue. The estimate of reduction in operating revenue is based on the existing water usage of 60 percent AVEK water and 40 percent well water. Revenue losses could range from 10 percent during Phase 1 to approximately 50 percent by Phase 9

The District's sources of funding are structured into four categories: Service Charge, Facility Surcharge, Water Quantity Charge, and Standby Charges. The Service Charge is a fixed connection charge based on the size of the meter. The Facility Surcharge and Water Quantity Charge are based on the actual quantity of water used each month. Standby Charges are assessed on all property and shows up on the customer's owner's tax bill. A reduction in water sales will affect only the Water Quantity Charge and Facility Surcharge, which in turn affects the maintenance and operation revenues, and capital improvements for the District.

If water sales do affect the operation and maintenance revenues, the County has the following measures to reduce such an impact:

- Extra revenues contributed by the conservation surcharge. Past experiences of implementing conservation surcharge during a drought has generated funds which were used to offset a portion of the operation and maintenance costs
- Delay capital improvement projects. If necessary, the County can authorize the transfer of funds in the District's Accumulative Capital Outlay (ACO) Fund allocated for capital improvement projects to be transferred to the District's General Fund.
- Increase Water rates. If ACO funds are not available, the County could recommend to Board of Supervisors to increase water rates to meet operating needs.

7.9 Reduction Measuring Mechanism in Water Use

During periods of normal supply conditions, District 40's supply and demand data are produced and distributed on a monthly basis. Water meter readings are collected bimonthly and compiled into yearly summaries.

During drought periods, supply and demand data is produced and distributed on a monthly basis, with excess water usage violation reported to the county and to the customer. Bi-monthly water meter reading are collected and compiled to determine if the water usage is reduced to the target goal.

8.0 WATER RECYCLING

8.1 Wastewater Collection and Treatment

There are several water reclamation plants (WRP) currently operating in the Antelope Valley; however, there are only two operating within Los Angeles County that treat significant waste streams and that generate large quantities of reclaimed water. The plants, which are both operated by the County Sanitation Districts of Los Angeles County (CSDLAC), serve the City of Palmdale and the City of Lancaster.

Palmdale WRP

The CSDLAC's District 20 operates the Palmdale WRP, which is located on 30th Street East, southeast of the Palmdale Airport. The Palmdale WRP is an undisinfected secondary treatment facility with a capacity of 8.0 million gallons per day (MGD). To accommodate anticipated growth in the Antelope Valley, CSDLAC intends to expand the plant to a capacity of 15.0 MGD.

Lancaster WRP

CSDLAC's District 14 operates the Lancaster WRP, which is located South East of the intersection of Antelope Valley Freeway (I-14) and Avenue C, near Edwards AFB. The Lancaster WRP is currently the only facility in Antelope Valley supplying tertiary treated water (0.6 MGD design capacity); however, the majority of the plant's flow is treated to a secondary treatment level. Total capacity of the plant is 10.0 MGD. To accommodate anticipated growth in the Antelope Valley, CSDLAC intends to expand the plant to a capacity of 16.0 MGD.

Average daily flow rates have been steadily increasing over the past several years. The Palmdale WRP's average flow of 7.9 MGD in 1991 approached the plant's average daily flow design capacity of 8.0 MGD. The average daily wastewater flow in 2020 is expected to be 37.2 MGD for the Palmdale WRP and 29.8 MGD for the Lancaster WRP.

8.2 Recycled Water Use and Wastewater Disposal Methods

Palmdale WRP

A portion of the effluent from Palmdale WRP is currently used for irrigating farmland on Los Angeles County Department of Airports (DOA) property. The DOA has a contract for up to 12 MGD of effluent. The remaining effluent is spread over 2,600 acres of land owned by the DOA. Approximately 0.3 percent of reclaimed water was used by local farmers on DOA property in 1991-1992.

Lancaster WRP

Undisinfected secondary effluent from the WRP is used for irrigating farmland at Nebeker Ranch. Tertiary effluent is used at Apollo Lakes County Parks for lake and irrigation use. The remaining effluent is disinfected and then discharged to Paiute Ponds.

8.3 Potential Uses of Recycled Water

Table 8-1 presents a list of potential reclaimed water users. The status, required treatment and estimated annual demands for potential reclaimed water users are also shown. The projected annual reclaimed water demand is approximately 32,200 acre-feet per year.

Table 8-1 Potential Reclaimed Water Customers			
User Name	Current Status	Required Treatment	Projected Demand (AF/YR)
Palmdale/Lancaster Tertiary System			
Palmdale High School	Existing	Tertiary	138
Desert Aire Golf Course	Existing	Secondary	120
McAdam Park	Existing	Tertiary	72
Courson Park	Existing	Tertiary	23
Desert Rose Elementary	Existing	Tertiary	26
Tumbleweed Elementary	Existing	Tertiary	26
Cactus K-8 School	Existing	Tertiary	36
Mesa Intermediate School	Existing	Tertiary	52
Palmdale Business Park	Future	Tertiary	118
Palmdale Business Park Golf	Future	Secondary	453
Antelope Valley Country Club	Existing	Secondary	375
Desert Sands Park	Existing	Tertiary	68
Yucca Elementary School	Existing	Tertiary	23
Highlands High School	Existing	Tertiary	100
Summerwind Elementary	Future	Tertiary	42
Lancaster Business Park	Existing	Tertiary	55
Serrano Ranch	Future	Tertiary	329
Serrano Ranch Golf Course	Future	Secondary	633
K&B Development Tract 49864	Future	Tertiary	47
Fox Airfield Commercial	Future	Tertiary	1,920
Lancaster City Park	Existing	Tertiary	150
Lancaster City Park	Existing	Tertiary	32
Jane Reynolds Park	Existing	Tertiary	30
Mariposa Park	Existing	Tertiary	28
Eastside Park	Existing	Tertiary	71
El Dorado Park	Existing	Tertiary	40
Skytower Park	Existing	Tertiary	48
Appollo Lakes County Park	Existing	Tertiary	129
Antelope Valley High School	Existing	Tertiary	130
Desert Winds High School	Existing	Tertiary	8
Parkview Intermediate School	Existing	Tertiary	65
Mariposa Elementary School	Existing	Tertiary	38
Joshua Elementary School	Existing	Tertiary	56
El Dorado Elementary School	Existing	Tertiary	25
Linda Verde Elementary School	Existing	Tertiary	28
Joshua Memorial Park	Existing	Secondary	90
Joshua Memorial Park	Future	Secondary	21
New Vista Elementary School	Future	Tertiary	43
Tertiary System Total			5,688
Secondary System Total (Agriculture/Ponds)			26,494

9.0 REFERENCES

Los Angeles County Department of Public Works. *1995 Urban Water Management Plan District 40*

Los Angeles County Department of Public Works. *1999 Water System Master Plan for Los Angeles County Waterworks District 40*